MARINE REVIEW.

VOL. X. CLEVELAND, O., DECEMBER 20, 1894. No. 25.

Government Contracts for Ships.

The ways of the departments at Washington are slow, but there is money appropriated in the national treasusy for at least two steamers, not war ships, upon which lake builders must soon be asked to submit bids, and bills now before congress provide for nine additional vessels—light-ships, light-house tenders and a revenue cutter—that may be built on the lakes if appropriations are secured and proposals from builders in this part of the country are low enough to bring the contracts here. The two steamers for which appropriations have been made are revenue cutters—one for the lakes and one for the New England coast. These vessels are to cost $175,000 each. The last congress appropriated $75,000 each for them, to begin construction, but for some reason the completion of plans and specifications has been delayed, until now the additional appropriations of $100,000 each are included in the treasury department estimates going before the present congress, and it is proposed to build a third vessel of the same type for the Pacific coast. Additional appropriations for the two vessels already authorized will undoubtedly be secured, and there seems to be no good reason for delaying the beginning of work on them, unless it is the intention of the revenue marine service to make a strong effort for an appropriation for the third vessel, and secure the advantage of contracting for all three at the same time.

The estimates for light-house tenders and light-ships are submitted by the light-house board, but of course there is some doubt about appropriations being secured for them. The list follows: Light-ship for Boston harbor, $35,000 in addition to a like amount already appropriated; light-house tenders for second, third and seventh districts, $85,000, $95,000 and $80,000 respectively; light-ship, entrance to Delaware bay, $70,000; relief light-ship for fourth district, $70,000; light-ship for Cape Lookout shoals, North Carolina, $70,000; launch for third district, $4,000; light-ship for Poe's reef, Straits of Mackinac, $25,000. If this last appropriation is secured, it is the intention to transfer the light-ship now at Poe's reef to one of the dangerous shoals at the entrance to Green bay, Lake Michigan.

Another Car Ferry Service on the Lakes.

All details for a car ferry service on Lake Erie between Conneaut, O., and Port Dover, Ont., are now fully settled, and it is expected that the two ferries, which are to be built by the Craig Ship Building Company of Toledo, will be in service by August of next year. A company separate from the Pittsburg, Shenango & Lake Erie Railroad Company and the Grand Trunk of Canada, which are the principal railway companies connected with the project, has been organized to own and operate the ferries under contracts with the railway companies. The new corporation is the United States and Ontario Steam Navigation Company, organized under the laws of New Jersey and having its principal office in Jersey City with branches at Conneaut, O., and Meadville, Pa. Incorporation under New Jersey laws and the maintenance of an office in that state are not matters of importance, as this proceeding is due only to features of law in the east that are more favorable to corporations than the laws of Ohio and other western states.

The capital of the new company is $350,000, divided into 3,500 shares of $100 each, and it is expected that this amount of money will be sufficient to build the two boats and provide for terminals at Conneaut and Port Dover. Officers are: President, A. C. Huidekoper, who is vice president of the Pittsburg, Shenango & Lake Erie Railroad; vice president, Hon. W. C. Culbertson of Girard, Pa.; secretary and treasurer, N. C. McLaughlin of Meadville, Pa. The directors are: Dumont Clark, president American Exchange National Bank, New York; W. C. Culbertson, Girard, Pa.; Samuel B. Dick, president Pittsburg, Shenango & Lake Erie Railroad; Hon. David Tisdale, M. P., Sincoe, Ont.; A. C. Huidekoper, vice president Pittsburg, Shenango & Lake Erie Railroad; John Craig, shipbuilder, Toledo; Lindsay Row, counselor at law, Jersey City, N. J. Messrs. Dick, Huidekoper and Culbertson are members of the executive committee and will have direct management of the affairs of the company.

Col. Dick and other promoters of this project, who had been trying to sell bonds for the construction of steel boats according to plans prepared by Mr. Frank E. Kirby of the Detroit Dry Dock Company, are understood to have given up this plan and concluded to put more money, on their own account, into less expensive wooden boats for the new company, after having made a trip across Lake Michigan in very heavy weather on one of the Ann Arbor ferries, constructed some time ago by the Craigs. The boats, upon which work is to begin immediately at Toledo, will, accordingly, be of the same design as the wooden ferries now on Lake Michigan, but will have four tracks and capacity for twenty-six instead of twenty-four loaded cars. They will draw about 12½ feet of water and are expected to make about 12 miles an hour in fair weather. As in the Lake Michigan boats, the power will be in two engines aft and one forward, all of the compound type. The engines aft will be 23 and 46 by 36 inches, and the forward engine 20 and 40 by 36 inches. Negotiations for the construction of this machinery are now pending with S. F, Hodge & Co. and the Frontier Iron Works of Detroit, Mich., and the contract will very probably go to one of these two concerns.

A prospectus just sent out by the new company gives all details of the tripartite contract between the Canadian and American railways and the navigation company. The arrangement seems quite advantageous to the project. Exclusive rights held by the Grand Trunk in the harbor of Port Dover are to be given up to the new company for twenty years, and the Canadian railway is to make an appropriation of $50,000 for sidings and approaches. Of course, the principal aim of the whole scheme is to make a direct connection between the coal fields of Pennsylvania and the consuming districts of Ontario through the Grand Trunk and over it to the Canada Southern, Canadian Pacific and other railways of the dominion. It is estimated that this connection will provide new territory for at least 500,000 tons of bitnminous coal, or about one-third of the present consumption in the province of Ontario. Lumber, grain and other leading articles of freight are expected to provide a return traffic but not, of course, as extensive as the probable tonnage of coal. By the distribution of rates agreed upon, the navigation company is to have a minimum of 25 cents a ton on coal and coke, with a higher schedule on other freight. On this basis, thc following figures are made for the two boats:

Forty-three weeks, ten trips a week, twenty-six cars each boat	22,360 cars
22,360 cars, averaging 25 tons, 560,000 tons, at 25 cents	$115,000
Excess of freight over coal rate on general business	25,000
Return business, passengers and merchandise	30,000
Total	$170,000

As against gross receipts of $170,000, as noted, expenses are figured at $96,000, leaving a balance of $74,000, and this, the prospectus claims, on a basis of only one and one-half trips a day for the boats, although it is thought they will be able to make two trips. It is claimed that by the ferry route Pittsburg will be eighty-two miles nearer Hamilton, Ont., than by any other railway route now in operation.

Particulars of Leading Transatlantic Ships.

Following are particulars of the new American Line steamship St. Louis with similar data regarding the chief express steamers with which she will have to compete on the Atlantic:

	Length in feet Overall.	Beam.	Depth.	Draft.	Dsplcmnt.	Power.	Speed.	Bulk Hds.	Engines
A. St. Louis	554	63	42	26	16,000*	20,000	20	17	Q'dple.
A. Paris	560	63.2	39.2	23	13,000	19,000	20	15	Triple.
B. Majestic	582	57.5	42.2	29.5	12,000	19,000	20	...	Triple.
B. Lucania	622	65	41.5	25	18,000	28,000	21¾	19	Triple.
G. Furst Bismarck	517	57.5	38	24	10,000	18,000	19	...	.....
G. Normannia	517	57.5	34	24	10,000	18,000	19	...	.....
F. La Touraine	535	56	34.5	24	10,000	18,000	19	...	.....

A, American. B, British. G, German. F, French. *At 26 feet draft.

Beginning Jan. 1, a signal known as the "hurricane signal" will be used by the United States weather bureau. It will consist of two red flags with black centers, displayed one above the other, and will be used to announce the expected approach of tropical hurricanes, and also of those extremely severe and dangerous storms which occasionally move across the lakes and the northern Atlantic coast.

There is no hesitancy in Great Britain's naval progress. It is understood that provisions will be made in the next navy estimates for the laying down of four first-class cruisers of the Blake type, of 13,000 tons displacement and 20,000 horse power. Two will be built in the government dock yards and two placed with contractors.

Late Publications.

Passed-Assistant Engineer McFarland's lectures on the "Modern Marine Engine, Boilers, etc," delivered in September last at the naval war college, Newport, R I., are published in full in the November number of the Journal of the American Society of Naval Engineers. These lectures treat of the very latest practice in marine engineering and are not highly technical. The November number of the Journal also contains, in full, the report of the contract trial of the triple-screw protected cruiser Minneapolis, and the horse power trial of the armored cruiser Maine, as well as an article on "Welded Steel Steam Pipes" by Warren E. Hill, vice-president of the Continental Iron Works, Brooklyn, N. Y., and a report from Chief Engineer Geo. W. Baird, U. S. N., on ' Potential and Economical Efficiency of Davis' Foundry Coke Under Conditions of Actual Service on Board the U. S. S. Dolphin." There is also among the original contributions an article by Passed-Assistant Engineer Harold P. Norton, U. S. N., detailing repairs to a broken valve chest on the Concord. Among matters pertaining to merchant ships the journal prints the test of the lake steamer Harvey H. Brown, made by George C. Shepard of Cleveland, and printed in pamphlet form by the Detroit Dry Dock Company: also a description of the steamer Globe of Cleveland, taken from a recent issue of the MARINE REVIEW.

The current number of the American Engineer and Railroad Journal, New York, contains a reprint of a paper on "Water Tube Boilers and their application to Steam Vessels," by Mr.J.Nastoupil, which was read recently before one of the leading German engineering societies. The merit of the paper is mainly in the fact that it is a contribution from a German standpoint on a subject that is now attracting most attention from marine engineers. The Belleville, Yarrow, Ward, Thornycroft, Babcock and Wilcox and other leading boilers of the tubulous type are described. They are classified into four groups—boilers with straight and level tubes, straight and inclined tubes, bent tubes and spiral tubes.

Although written for the people, and consequently without technical phraseology, Edgar Stanton Maclay's "History of the United States Navy from 1775 to 1894," the second volume of which was recently received from D. Appleton & Co., New York, is a work that will increase in favor among marine and naval men as its merits become better known. It is a substantial addition to historical American literature, and from a technical point has the advantage of revision by Lieut Roy C. Smith, U. S. N. But this latter feature does not interfere with the interest that attaches to the authors's conscientious narrative, resulting from nine years devoted to the task. The work complete in two volumes sells at $7.

Recent numbers of Industries, the San Francisco engineering magazine, contained a series of articles by John Richards, editor of the magazine, treating of centrifugal pumps, their construction and operation, origin and development in this and other countries. The articles have been revised and published collectively in neat form by the Industrial Publishing Company of San Francisco. The book is offered for sale at $1.

Some Strong Points on the Taxation Question.

It will be remembered that Mr. E. T. Chamberlain, United States commissioner of navigation, some time ago gave out a short summary of information secured from leading shipping countries, and from states throughout this country, on the subject of taxation of vessel property. In his annual report, he presents an exhaustive review of this subject, the whole matter tending to show that only the earnings of shipping are taxed in Great Britain, Germany and other countries that are our natural rivals at sea, and that a similar policy should not only be pursued by the general government but by the states as well, especially in lake states, where the earnings of vessels are certain to be spent to the advantage of the community in which they are owned. Summing up a great mass of statistics on the subject, the commissioner says:

"As a rule, the seaboard and lake states tax shipping as other property is taxed, regardless of the facts that maritime nations usually impose no taxes on shipping as property, but tax only the actual earnings of shipping, and that, from the very nature of its use, shipping can not share in the benefits which are bestowed by the distribution of the proceeds of state and municipal taxation for public purposes. A moment's review of the various public purposes for which the proceeds of state and local taxes are usually expended will show that shipping derives little or no benefit from them. In short, when a vessel is fulfilling the function for which it was built it is navigating the ocean, remote, except during its brief sojourn in port, from the fields and purposes to which state and local taxes are applied. An exemption from all taxation, such as New York allows to vessels owned in the state engaged in foreign trade, is not open to the objection which has been raised that such exemption is a special privilege and indirectly a bounty. If the privilege is special, so, too, is the class of property special, in that it can not be benefited by taxation as real and personal property are benefited. If it is a bounty, then that bounty is expended, and more too, in the various forms of navigation charges by which shipping the world round is required to take care of itself as well as to contribute to the expense of government, usually beyond the amount of services actually rendered in return for such payments.

"Still further, heavy taxes on shipping are easily evaded by the owners of large amounts of tonnage, and thus fall with the greater weight on small vessel owners. It is relatively an easy matter for the owner of several vessels to form a partnership with the resident of another state, or another city or town in the same state, in which low taxes or none at all are imposed on shipping, and by allowing the vessels to stand in the name of such partner to escape the endeavor of the law to tax him more than his competitors in navigation are taxed. The experience of the city of Chicago some years ago illustrates admirably the result of endeavors to impose heavy taxes on shipping. Some fifteen years ago the local assessors set out to tax the shipping owned at that port on its full insurable value at the rate fixed for municipal taxes for the year. The vessel owners of Chicago, in self-defense and to enable them to continue in business against competing ports, were compelled to make nominal transfers of their property, and thousands of tons of shipping, doubtless owned in Chicago, appeared later on, on the records of this office, as owned in other states or other districts in Illinois. A considerable percentage of the tonnage returned from New York and Boston is unquestionably owned in other states, and has made these cities hailing ports on account of the liberal tax laws of New York and Massachusetts. State tax laws undoubtedly have the effect of transferring the ownership of shipping, at least in name, to states which by their laws endeavor to equalize tax matters in this regard.

Around the Lakes.

Tuesday, Dec. 11, is the date of closing the Welland canal this year.

Grain carrying vessels in winter quarters at Milwaukee are capable of loading 3,215,000 bushels of wheat.

Saginaw lumber men have been successful in their efforts to secure a removal of the Canadian duty on boom sticks used in towing logs across Lake Michigan. The Canadian privy council announces that no duty will be charged next spring.

Frank A. Flower, of Superior, Wis., who was among the most active representatives of lake interests at the deep waterways convention in Toronto, has published in pamphlet form a report of the convention, which is addressed to the mayor and council of Superior.

Dunbar & Sullivan, dredging contractors, have been purchasing new machinery for their repair shops at the Sault and will this winter build a steel scow 162 feet long. It is the intention to equip a shop so as to build scows and make general repairs to their dredging plants on their own account.

It is proposed to use a new type of tubulous boiler in the yacht being built by the Detroit Boat Works for Edward Henkel of Detroit, and for which triple expansion engines, recently illustrated in the REVIEW, were built by S. F. Hodge & Co. The boiler is the invention of H. H. Taylor of the Detroit Screw Works.

The Charlevoix Lumber Company of Charlevoix, Mich., purchased at marshal's sale, Monday, for $1,500 the wreck of the schooner Annie P. Grover which was stranded at the Manitous last summer and released in the fall. She will be used as a tow barge for the new steamer bing built at Charlevoix for the same firm.

John B. Trevor is the name selected for the whaleback steamer which the American Steel Barge Company is completing at West Superior on its own account. There are no indications of the company adding any more boats to its own fleet, but the two oil barges for the Standard Oil Company, on which they are the lowest bidders, will cause some activity in the West Superior yard.

Never before has repair work, some of it including expensive insurance jobs on steel vessels, been more active around the lakes. The Ship Owners Dry Dock Company of Cleveland has for some time past been considering the question of enlarging one of its docks on a big scale, but the rush of work now on hand will probably delay the improvement longer than was expected. Provision must be made, however, for the new steamers that are reaching a length of 400 feet keel, and as soon as possible the dock referred to will be enlarged to a length of 425 feet or more.

In the Minneeota legislature this winter an effort will be made to reduce royalties on iron ore mined from state lands and also to regulate freight charges on ore hauled from the Mesabi range over the two ore railways, which are entirely within the state. This movement is, of course, fostered by the smaller mining companies, who are operating on state lands, and who have no way to forward their ore to market excepting over the railways controlled by the Minnesota Iron Company and the Rockefeller syndicate. As these latter corporations are leading producers of ore from lands in the same territory, on which they hold the fee, it is not at all probable that they will submit to state reguiations fixing railway rates, or allow the matter of reducing state royalties to pass, without opposition of the kind that usually counts in such matters.

Oil Barges—Torpedo Boats—Lake Ship Building.

A telegram to the REVIEW from Mr. R. C. Veit, of New York, superintendent of transportation for the Standard Oil Company,announces that the American Steel Barge Company is the lowest bidder for the work of constructing two oil tank barges, which the Standard will operate on the lakes or the Atlantic coast. Several lake builders put in bids on this work, which were opened in New York on Monday. It is not thought that any special preference was given to the American Steel Barge Company, on account of its close relations to Standard Oil interests. The boats are to be 170 feet long, 33 feet beam and 17 feet deep. If built according to the the design upon which bids were asked, they will hardly be called barges on the lakes, as the specifications called for a very trim craft, somewhat similar to the United States light house tenders Lilac and Columbine, built some time ago by the Globe company, Cleveland. They will each have two masts, schooner rigged, with houses and all upper works of steel. The plans called for no power aside from a small donkey boiler to work pumps that are to be supplied by the owners. One feature of the work of constructing these barges that was considered quite important by some builders who submitted proposals on them, is the expense connected with the matter of making them tight. Oil will work through seams that would be entirely satisfactory in ordinary cargo vessels, and it is understood that the Standard insists on vessels of this kind being perfectly tight. Atlantic coast builders as well as builders on the lakes submitted bids on these boats, with the privilege of delivering them in New York, as against the privilege here of delivering them in Cleveland, so that it is not probable that the American Steel Barge Company's profit on them will be very great, especially as that company must be at something of a disadvantage, when compared with lower lake builders, in the matter of cost of material. Each of these boats will have capacity for 8,000 barrels of oil. If used here the Standard takes up with these boats a new method of transportation on the lakes, although such barges are not new to the coast and transatlantic trade The boats will very probably run between Cleveland and the head of Lake Superior, if kept on the lakes, provision being made at Duluth or some other point at the upper end of the route for tank storage of the oil which is to be distributed throughout the northwest.

All lake builders have received from Chief Constructor Hichborn of the navy specifications for the three torpedo boats, for which $150,000 each is now available in the United States treasury. Gen. Mngr. John F. Pankhurst of the Globe Iron Works Company says he will immediately write the navy department to learn, if possible, whether lake builders will be debarred from getting this contract, on account of treaty relations governing the building or maintenance of war vessels on the lakes, and if he is encouraged to submit a proposal his company will do so immediately. The specifications call for boats 160 feet long, of 2,000 horse power and to develop about 24½ knots speed. This is big power and high speed but there is no doubt of lake builders adapting themselves to it as readily as other works in the country. The boats are fully described and illustrated in our issues of Oct. 25 and Nov. 8. It is well known that the navy department is desirous of giving lake builders a trial on naval work, and especially boats of this kind, in order that the government may be in a position to call for the construction of torpedo boats or other effective craft of their kind, in event of a sudden call for boats to protect the United States coast line on the lakes. There is a special reason, therefore, to expect support from congress and executive departments if this matter is pushed by lake builders at the present time.

The Craig Ship Building Company of Toledo is figuring on a contract for a small steel steamer like the Ketcham, which they built two years ago. If the contract is secured, it is intended to put this boat down with the two wooden car ferries, for which the Toledo builders have a contract. Work on this company's big dry dock is also being hurried and it is expected that it will be completed about March 1. The dock will be about 400 feet long, 50 feet wide at the bottom and 100 feet at the top.

President W. G. Mather of the Cleveland Iron Mining Company, owning the steamers Pontiac, Pioneer, Cadillac and other boats, has been thinking of submitting to the directors of his company the question of building one or two steel barges to be towed behind the steamers. He has simply asked for rough estimates from builders without going into details of plans or specifications.

At Chicago George Warrington is building a steel steam yacht for H. F. Batch of that city. Her dimensions are 130 feet over all, 110 feet on water line, 16 feet beam, 10 feet 6 inches depth of hold; engine triple expansion 12, 19 and 32 by 18. Steam will be supplied by two Warrington water tube boilers. Her estimated cost is $75,000.

Contracts for the passenger steamer for the Cleveland and Buffalo Line, and the big 400-foot iron ore steamer and two tow barges proposed for the Minnesota company of Cleveland, are delayed, but there is little doubt of orders being given for these boats soon enough to permit of their completion some time next spring.

J. J. Hill of Marine city has asked for bids on propelling engines and other machinery for a twin screw steamer of 135 feet keel, which will probably be built of wood at Marine City. The boat is to be of light draft, as she is intended for service between Mt. Clemens and other points on the rivers.

The Jenks Ship Building Company of Port Huron has launched its new steamer Linden. She is 203 feet keel, 35 feet beam and 13 feet deep. and will carry 1,500 tons of ore or 1,100,000 feet of lumber.

It is expected that both of the steel tow barges being built by the Chicago Ship Building Company for the Minnesota Steamship Company will be launched before Jan. 1.

In General.

Excluding about 62,000 small craft, the commerce of the world is carried on by 45,000 vessels of 20,500,000 registered tons.

State Engineer Adams of New York, alike to his predecessors, favors the use of electric power for canal boat propulsion, and it is understood that his annual report will contain some important reccommendations in this regard.

Keels of the English battle ships Magnificent and Majestic were laid less than twelve months ago, and now both vessels are about ready to be floated, with all their armor plate on, boilers fitted and a good deal of their machinery on board.

A contract for a passenger steamer of considerable value has been secured by the Newport News Ship Building and Dry Dock Company of Newport News, Va. The boat is for the Norfolk and Washington Steamboat Company and will cost about $250,000. She will be named Newport News.

Lewis Nixon, superintending constructor of Cramp's ship yard, Philadelphia, has leased the Crescent ship yard of the Samuel L. Moore & Sons' Company, Elizabethport, N. J. The yard is equipped for building vessels up to 400 feet in length. The firm of Samuel L. Moore & Sons will continue the foundry and machine shop departments.

A late dispatch from San Francisco says that the steamer Keweenaw, which was built by F. W. Wheeler & Co. of West Bay City, Mich., and sent down the St. Lawrence and around the Horn to the Pacific, has been long overdue from a port in British Columbia, and it was thought she had been lost with all hands. The dispatch reported terrific gales on the coast, and fears were entertained for several other vessels of which there were no tidings. The Keweenaw is owned by the Saginaw Steel Steamship Company, in which Mr. Arthur Hill of Saginaw, the Wheeler company and others on the lakes are interested.

Life Saving Records Covering Twenty-four Years.

The statistics of the United States Life Saving Service, covering in wreck reports such matters as lives and property involved, property saved, etc., are questionable, on account of the manner in which they are prepared, through the life savers themselves, who must depend largely upon estimates in making reports, and who do not, of course, confine these estimates to cases where the service alone is to be credited with saving life and property. But, admitting that these conditions exist in the preparation of the statistics, they are nevertheless, interesting. From an advance summary of Supt. Kimball's annual report, the following figures are taken, covering disasters within the field of the operations of the service in this country, from the introduction of the present system in 1871, to the close of the past fiscal year on June 30, last: Total number of disasters, 7,625; value of vessels, $84,922,075; value of cargoes, $38,039,774; property involved, $122,961,849; property saved, $93,155,522; property lost, $29,806,327; number of persons involved, 61,422; lives lost, 724; persons succored, 11,221; number of days' succor afforded, 29,148.

One of Capt. Alex. McDougall's latest original propositions is to build an island in the basin forming the harbors of Superior and Duluth with the earth that is to be dug up, if appropriations for a 20-foot harbor at the head of the lakes are secured in accordance with the recent recommendation of a commission of government engineers. He thinks that 500 acres of land could be made from the dredgings, and there would be a saving of cost in disposing of the earth in this way instead of towing it far out into the lake.

Col. James Pickands, Messrs. L. C. Hanna, Harvey H. Brown, D. Z. Norton and W. D. Rees, all of Cleveland and all principals in leading Bessemer ore producing concerns of the country, met by accident at the Waldorf, New York, a few days ago, and a rumor of plans to fix prices of ore for next year's delivery was immediately started. It is certain, however, that the meeting was purely accidental and that ore prices were not spoken of.

Capt. Alex. McDougall has patented an ash ejector, which is described in the list of patents published elsewhere in this issue.

Truths About Defects in the Canadian Sault Canal.

The REVIEW has been making some inquiry of late relative to defects in the Canadian canal at Sault Ste. Marie, Ont., and it would seem that criticism of the work published thus far makes no reference to the real cause of weakness. The trouble exists in the upper level, or channel approach to the lock, from the river above. The cut was made through sandstone rock and drift similar to that on the American side. For retaining walls or piers, the rock was cleared off down to a point where it was found solid, and on this light wooden piers were constructed up to the point of low water when the canal should be filled with water. On this wooden structure, stone work was erected to complete the height of the wall, this stone work reaching from the coping down to perhaps a foot under water. About the time this stone work was nearly completed, and back filling was well under way, it was found that the wall in many places was disposed to slide into the canal, in some places it was tipping or sliding in towards the channel from one to two feet. It was determined to save the work by putting wooden props from the wooden pier work down to the bottom of the canal. This was done, placing sticks at short intervals, the spaces between being filled in with concrete and mason work to hold the braces in position.

Of course, when the canal is filled with water the pressure of the water on the inside aids in preventing the walls slipping into the canal, and it is probable that most of the work will stand in position at least until the water should be drawn out, or during a long period of years for all that is now definitely known regarding it. To the vessel owners or vessel masters, one of the principal objections to the canal now, after the above repairs have been made, is the slanting wall or row of stick braces against which the bilge of a boat would doubtless strike before the fender strake or fenders would bring up on the wall. But this would do no harm, if the boats contemplating using the canal would protect themselves with a heavy fender strake extending below the bilge. The wheels of a boat are likely to strike on this network of braces, and it may be necessary to incur the expense of tugs in some cases in the canal in order to avoid this danger, but these are matters that will be settled more definitely after the canal is in use. It is certain, however, that the light crib work on which the stone wall was placed, made the construction much cheaper to the contractors than it would have been had it been built according to more substantial methods followed by the United States engineers on the American canal.

Lake and Atlantic Canal—A Measure in the Senate.

Senator Vilas of Wisconsin is keeping his promise with the Deep Waterways Association, formed recently as a result of the convention held in Toronto a few months ago. He has introduced in the senate an amendment to the sundry civil bill authorizing the president of the United States to appoint, immediately after the passage of the act, three persons, who shall have power to meet and confer with any similar committee which may be appointed by the government of Great Britain or the dominion of Canada, and who shall make inquiry and report whether it is feasible to build such a canal as shall enable vessels engaged in ocean commerce to pass to and fro between the great lakes and the Atlantic with an adequate controllable supply of water for continual use; and also to report as to where such canal can be most conveniently located, the probable cost of same with estimates and detail; and if any part of same shall be built in the territory of Canada, what regulations or treaty arrangements will be necessary between the United States and Great Britain to preserve the free use of such canal to the people of this country, with all the necessary facts relating to the construction and future use of deep water channels between the great lakes and the Atlantic ocean. The members of the committee shsll serve without compensation, and $10,000, or so much as may be necessary, is appropriated for their actual traveling and other necessary expenses.

Immense Iron Business.

It is given out quite positively that the management of the Metropolitan Land and Iron Company of Milwaukee, controlling the Norrie mine, is fully decided, even on present conditions in the iron market, against selling ore for next season's delivery at 1894 prices. The Metropolitan company, with its heavy output of standard Gogebic Bessemer, has fixed prices for two years past by leading the sales market. Unfavorable comment attending this company's heavy sales last winter, which fixed the price of Bessemer at $2.75 a ton—when it was practically proven later that $3 might have been obtained in the first transactions,—seems to have been justified by reports now of very meager profits on the business of the Norrie for the past year. Cleveland ore dealers who have talked with the principals of the company say that their action a year ago was due almost entirely to the Mesabi scare, and it is not at all likely to be repeated again this year, especially as there is absolute certainty of a limit to the use of ore from the new range for Bessemer purposes.

The same feeling prevails among all of the iron ore producing companies, and it is this feeling, with the prospects of an increase of a million or a million-and-a-half tons in production next year, that has caused a renewal of building operations in the ship yards and hopes of some improvement in lake freights. There is no let-up in the production of pig iron, and of course it is practically all Bessemer. Reports on Dec. 1 showed a production of 178,325 tons a week, or at the rate of 9,300,000 tons a year. Prices are still very low, but the iron is being consumed and there is little in the way of future sales. It is not being stocked, except in a few cases where manufacturers are in a position to hold a part of their product with a view to some improvement in prices after Jan. 1.

With reports of the production of pig iron in hand to Dec. 1, the American Manufacturer of Pittsburgh estimates the 1894 output of all furnaces in the United States at 6,600,000 tons or about 500,000 tons less than that of 1893, and commenting on the present situation the same authority says: "The indications are that unless something now unforeseen happens the production of 1895 will be one of the largest in the history of the iron trade of the United States. Possibly not so large as 1892, but the largest known, except the production of 1892."

Didymus on Deck.

Editor MARINE REVIEW: A little knowledge is a dangerous thing and not every man who writes himself engineer is entitled to the name. A certain eastern paper which shall be nameless, attempts to be funny with the report of the tests of the steamer Madagascar, recently published in the REVIEW. One would think that the report as published is worded plainly enough, but this would-be critic takes a word here and there and so creates a sort of straw man which he proceeds to knock down for the edification of his readers. After reciting certain platitudes regarding the comparative economy of early and late cut offs, and which are only empirically correct, he says: "In a test of engines recently made it is asserted that the engines were designed to cut off at 75 per cent. in the H. P. cylinder, but experience shows that greater economy results in working at later cut offs! What cut off can that be?"

The evident intention is to create the impression that the assertion is made that a cut off later than 75 per cent. is more economical than an earlier cut off, and also that in his estimation 75 per cent. is the very limit of extravagance.

The report says no such thing. If this scissors writer will turn again to the report he will see that it says plainly: "Both tests were made under ordinary working conditions. The engines were designed to be worked ordinarily with a high pressure cut off of from 65 to 75 per cent. While cards No. 3 show a remarkably equal distribution of work, test No. 2 (cards No. 8) seem to show the greater economy of working triple engines at later cut offs."

If this means anything, it means that the two sets of cards (No. 3 and No. 8,) were taken at what was intended for ordinary points of cut off—from 65 to 75 per cent.— and that the second set and accompanying particulars indicate that the engines showed better economy at a later cut off than at 65 per cent.

Economy is only a relative term, and while no one disputes that it will take less steam to fill one-half the volume of a cylinder than to fill a larger proportion, yet it is quite possible that results would more than justify the latter course. In other words, one horse power may be obtained with a smaller expenditure of water and fuel in the latter case than in the former. And if he thinks 75 per cent the limit as to cut off, what would he say to 84 per cent! The economical point of cut off will be determined by cylinder ratios and by initial and terminal pressures, and it is of no particular consequence whether the steam is expanded in this cylinder or that, so long as the results sought for are obtained. However, the time spent in making reply to such senseless comments is simply wasted, and the best answer is that furnished by the engines themselves. As a lake engineer, I have lots of faith in lake engine builders, and the efforts of eastern know-it-alls to constantly belittle their work makes me tired. They are not out of the woods yet down there by any means. We have some (a good many), eastern engines here with us, and I have yet to learn of their having done anything to boast of.

Cleveland, Dec. 17, 1894. T. H. RUST

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Dec. 15, 1894:

	Wheat, bu.	Corn, bu.
Chicago	26,173,000	1,716,000
Duluth	7,226,000	3,000
Milwaukee	808,000	.....
Detroit	1,315,000	27,000
Toledo	3,264,000	1,003,000
Buffalo	4,742,000	395,000
Total	43,528,000	3,144,000

At the points named there is a net increase for the week of 1,166,000 bushels of wheat and 328,000 bushels of corn.

Full List of Appropriation Estimates.

From the book of estimates, just presented to congress by the secretary of the treasury, the REVIEW is enabled to present a full list of appropriations recommended for public works on the lakes, covering the fiscal year that begins with June 30, next. Of late years, reports of the district engineers regarding proposed river and harbor improvements and new aids to navigation have not been made public until the estimates are submitted to congress, and the list, which is here printed in full, is the more valuable on this account. The list of lights, fog signals, etc. is divided into three classes as follows:

ESTIMATES FOR LIGHTS FOG SIGNALS, ETC.

Indispensable—Supply and buoy depot, Detroit, $15,000; Keewaunee, Wis., pier light, $7,000; Manistique, Mich., light and signal, $32,000; Manitowoc, Wis., fog signal, $5,500; North Manitou island, Lake Michigan, light and signal, $20,000; Porte des Morts, Mich., (Death's Door), range lights and fog signal, $21,000; South Fox island, Mich., fog signal, $5,500; Sturgeon Bay canal entrance, Wis., light, $20,000; Cleveland, keeper's dwelling and store house, $20,000, to be derived from sale of present abandoned light-house site; Conneaut, O., range lights, $2,500; Grassey island, Mich., range light stations, north and south ends, and keeper's dwelling, $10,700; Grosse Isle, Mich., dwellings for keepers of north and south channel lights, $8,500; Maumee bay, O., new beacon at each end of range and keeper's dwelling, $25,000; Cheboygan river, Mich., front range station, additional land, $1,750; Chequamegon point, Wis., light and bell, $10,000; Devils island, permanent tower, $22,000; Grosse point, range lights to displace light-vessel, $8,260; Mendota, Bete Grise bay, Mich., reestablishing light, $10,000; Portage lake and Portage river, lights, $10,500; Portage lake canal, Mich., pierhead, fog signal, $5,500; Superior and St. Louis bay, Minn., reestablishing and protecting beacon and post lights $11,200.

Necessary—Ludington, Mich., keeper's dwelling, $4,500; Michigan City, Ind., signal, $5,500; Peshtigo shoal, Green bay, Mich., light and signal, $10,000; Sheboygan, Wis., signal, $5,500; Tail point, Green bay, Mich., moving light and fog bell, $7,500; Carlton island, St. Lawrence river, N. Y., light, $8,600; Galoo island, Lake Ontario, N. Y., signal, $5,700; Fort Niagara station, Buffalo, keeper's dwelling, $4,000; Erie, Pa., light-house and buoy depot, $35,000; Tibbett point, Lake Ontario, N. Y., signal, $4,300; Bayfield, Lake Superior, Wis., light, $5,000; Big Sable, Mich., signal, $5,500; Eagle Harbor, Lake Superior, Mich., signal, $5,500; Grand Marais, Lake Superior, Mich., light and signal, $15,000.

Desirable—Escanaba, Mich., fog bell, $1,100; Gladstone, Mich., light, $10,000; Little Gull island, entrance to Green bay, light and signal, $20,000; Menasha, Wis., range lights, $5,000; Old Mackinac point, Mich., additional land, $1,000; Portage lake, keeper's dwelling near pierhead range, $3,500; St. Joseph, Mich., signal, $5,000; St. Martin island, Green bay, Mich., light and signal, $15,000; South Milwaukee, Wis., light, $7,500; Bay State shoal and Oak point shoal, Lake Ontario, N. Y., temporary floating lights, $800; Lorain, O., fog signal, $4,300; Fairport, O., fog signal, $4,700; Port Clinton, O., reestablishing light, $1,500; Presquile, Erie harbor, Lake Erie, signal, $4,300; Wilson harbor, Lake Ontario, N. Y., light, $2,500; Eagle River, Mich., moving light to Sand Hills, $20,000; Hat point, Lake Superior, Minn., light and signal, $15,000; Poe's reef, straits of Mackinac, Mich., light vessel, $25,000.

Among the general estimates of the light-house board there is an item of $50,000 for gas buoys, and if the appropriation is secured it is more than probable that a few of the buoys will be assigned to stations on the lakes.

ESTIMATES FOR RIVER AND HARBOR IMPROVEMENTS.

There is, of course, some question of any appropriations for rivers and harbors being secured at the present session of congress, but the continuous appropriations that are carried by the sundry civil appropriation bill, and that apply on the lakes to the St. Mary's river and 20-foot channel work are about as certain of passage as they have been at previous sessions. Estimates made by the secretary on this work include $483,865 for completing the improvement of St. Mary's river at the falls, $150,000 for continuing improvement of Hay lake channel and $500,000 for the 20-foot channel work extending throughout the connecting waters of the lakes. Other estimates of the engineers showing amounts that can be profitably expended on the numerous harbor projects throughout the lakes are:

Michigan—Black river at Port Huron, $15,000, and at mouth of river $10,000; Clinton river, $25,000; Detroit river, completing work, $121,258; Rouge river, $5,000; Rouge river, turning basin, $10,500; Saginaw river, $150,000; St. Joseph river, $2,500; waterway from Keweenaw bay to Lake Superior, $800,000; Sturgeon Bay and Lake Michigan canal, 78,450; same, harbor of refuge, $7,000; Menominee river, maintenance, $10,000; Alpena, $5,000; Charlevoix, $53,000; Frankfort, $51,000; Grand Haven, $80,000; Grand Marais, harbor of refuge, $100,000; Ludington, $35,000; Manistee, $61,000; Marquette, $134,000; Monroe, $11,000; Muskegon, $150,000; Ontonagon, $33,000; Pentwater, $45,000; Petoskey, $125,000; Portage lake, harbor of refuge, $125,000; St. Joseph, $115,000; Sand Beach, $150,000; Sangatuck, $35,000; South Haven, $62,000; White Lake, $62,000; Menominee, $15,000.

Wisconsin—Ahnapee, $15,000; Ashland, $143,500; Green Bay, $46,915; Kenosha, $54,500; Keewaunee, $66,944; Manitowoc, $5,000; Milwaukee, $20,000; Milwaukee, harbor of refuge, $188,738; Oconto, $10,000; Pensaukee, $1,000; Port Washington, $12,000; Racine, $36,500; Sheboygan, $81,900; Superior and St. Louis bay harbor, $156,736; Two Rivers, $18,800;

New York—Buffalo, $81,223; Charlotte, $75,000; Dunkirk, $108,117; Great Sodus bay, $28,000; Huntington, $10,000; Little Sodus bay, $40,000; Ogdensburg, 56,950; Oswego, $58,000; Pultneyville, 7,500; Rondout $10,000; Tonawanda and Niagara river, $200,000; Wilson, $29,091.

Ohio—Ashtabula, $180,000; Lorain, $36,000; Cleveland, $200,000; Conneant, $200,000; Fairport, $100,000; Huron, $50,000; Port Clinton, $21,000; Sandusky, $100,000; Toledo, $300,000; Vermillion, $4,000.

Illinois—Calumet, 30,000; Chicago, $100,000; Waukegan, $41,000.

Minnesota—Agate Bay, $121,708; Duluth, $237,323; Grand Marais, $9,320.

Indiana—Michigan City, $235,000.

Pennsylvania—Erie, $25,000.

Lansing and Gravelly Shoals.

Everybody on the lakes has heard of gas buoys, and for a long time it has been expected that a few of them would be brought into service here, but a move in this direction by the light-house board has been prevented on account of the difficulty in getting them charged. A short time ago, however, the board passed a resolution that gas buoys be placed on Gravelly island, Poverty passage, and on Lansing shoal, north of Squaw island, Lake Michigan, and there is every reason to expect that these two points will be marked some time next season with buoys of the Pintsch type. The firm controlling patents on them—Safety Car Heating and Lighting Company of New York—now have gas manufacturing plants at Buffalo, Cleveland, Toledo, Detroit and Chicago, and recharging of buoys in almost any part of the lakes can be easily effected. The light-house board expects to obtain from the present congress an appropriation of $50,000 for buoys of this kind to be used in different parts of the country. At Gravelly island and Lansing shoal the buoys are expected to take the place of light-ships which had been proposed for both points. The buoys cost about $2,500 each. Two are needed for each station,—one to be on service while the other is being re-charged with gas; thus making the total cost to the government for each station about $5,000, and of course the cost of maintenance is far less than that attending light-ships.

Latest Solution of Economy at Both High and Low Powers

In his series of lectures delivered recently at the naval war college, Newport, R. I., Passed-Assistant Engineer McFarland. U. S. N., refers to this subject at some length, reviewing the efforts of the navy department to combine efficiency at both powers in the Maine, New York, Columbia and other vessels.

"The latest solution of this problem" he says "is presented in the gunboat No. 7, the primary idea of which was due to Professor Hollis while still an officer of the service and one of the designers in the bureau of steam engineering. In this case the engines at full power will be quadruple expansion, the steam for the high pressure cylinders being supplied by coil boilers, while two cylindrical boilers, which are also fitted, will supply steam to the first receiver, provision being made to deliver the steam from these two boilers into the receiver at the same pressure as the exhaust from the high pressure cylinder. At reduced powers the large low pressure cylinders will be disconnected, and the three remaining smaller cylinders will constitute triple expansion engines working with steam of 160 pounds pressure either from the two cylindrical boilers or from the four coil boilers as may be desired. This is one of the most novel designs which has been brought out in marine engineering for many a year, and there is every reason to anticipate great success from its use. It is a particular advantage of this plan that the boilers which will be ordinarily thrown out of use when running at low speeds are themselves very light, so that the design has enabled powerful machinery to be obtained on very light weight."

The Thurman Fuel Oil Burner Company of Indianapolis resents the intimation that their burners are in any way alike to burners that have been used in Russia for some years past. They have fitted a large number of yachts and other craft with the device and have reports of the highest success with it in all cases.

"SAILING DIRECTIONS FOR LAKE SUPERIOR, ST. MARY'S RIVER AND STRAITS OF MACKINAC" IS A PUBLICATION JUST ISSUED BY THE UNITED STATES HYDROGRAPHIC OFFICE. IT IS FAR IN ADVANCE OF PUBLICATIONS OF THE COAST PILOT KIND. PRICE $1. ADDRESS MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O. WE HAVE NO HESITANCY IN RECOMMENDING THIS BOOK.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THE REVIEW entertains the highest regard for the firm of Brown & Co. of Buffalo and Mr. Edward Smith of that firm, but we can not refrain from referring to the fact that Mr. Smith's action in going to Milwaukee and libeling the steamer Spokane on a salvage claim of thousands of dollars for service rendered her when in a disabled condition on Lake Michigan, by the steamer City of Venice, is generally considered a mistake. Salvage claims of this kind have come to be matters that will admit of public consideration. It is well understood that there was no personal difference between Capt. Thomas Wilson and the owners of the City of Venice to cause hasty action in this matter, or the filing of such a large claim, and this is all the more reason why the action of the owners of the Venice is unfortunately regarded as an incentive to further strife between owners when occasions for claims of this kind arise. Of course, it may be said that the owners of the Venice were desirous of fortifying themselves against the Spokane's valuable cargo escaping liability in the salvage claim, but surely there was no danger of the Spokane's owners giving up the cargo without indemnity. Mr. Smith may have acted under orders from his owners, but however this may be it is the spirit of the matter and not the parties to it that is referred to. In a peaceful and reasonable settlement of this claim, the owners of the Venice could well afford to depend upon Ed. Smith's reputation as one of the shrewdest men in the lake business to get for them all that they are entitled to.

NO RIVER and harbor bill is expected from the present congress, so that the great plea of lake vessel owners will be for new aids to navigation. The United States has been for a century actively at work in perfecting its lighting system on the sea-coast, and particularly on the Atlantic and gulf coasts, but the lighting of the lakes has been very largely a matter of the last fifteen years. Executive officers of the Lake Carriers' Association are now engaged in directing the attention of members of the appropriation committees of both houses of congress to the needs of the lakes in this regard. The work is in the hands of Secretary Keep of Buffalo and Capt. George P. McKay of Cleveland and they ask that vessel owners at all lake ports write their representatives in Washington to secure personal interviews with members of the appropriation committees of both houses, and urge that reports of these committees favor appropriations recommended by the association, which are of course in accordance with the unanimous opinion of lake shipping interests.

CITIZENS of Sault Ste. Marie want the government to locate a marine hospital at that point. They are also desirous of building a ship railway for repairs to small vessels with a fund of $68,000, which reverted to the government upon the St. Mary's Falls canal being taken over from the state of Michigan. The fund was intended for the building of a dry dock at the Sault, but the government has refused to enter into the dry dock business in competition with private concerns. The people of the Sault have taken on a spirit of enterprise, and they propose to bring these matters to the attention of the Lake Carriers' Association at its annual meeting next month. They will probably be treated cordially, but they will find the Lake Carriers too busy on big projects to spend much time on matters of a local kind. Interests of this kind in the canal town will be best served by energetic personal work on the part of its citizens with Michigan representatives at Washington.

ELDERKIN of Chicago Seaman's Union fame continues to write letters to the Pacific coast organ of the union with as much earnestness as though an organization of some importance really existed on the lakes. Applied in some other direction, Elderkin's ability might prove profitable. The letters he forwards to San Francisco are of a vigorous kind and they are sometimes very amusing. For instance, in reviewing the past season's business on the lakes, he says: "The wages paid to non-union men during the season ranged from $20 to $35 per month, but these men can not be called seamen. They are of that sort who, if given a life of 150 years, would certainly, before the expiration of that period, be found up in trees throwing cocoanuts at each other."

FROM all of the ship building centers throughout the country vigorous protests are heard against President Cleveland's free ship recommendations. Arthur Sewall & Co., of Bath, Me., sends us a copy of a very forcible appeal to congress and the country against any free ship legislation, which was adopted at a fully attended meeting of citizens of that place held a few days ago. The arguments of the people of Bath should be especially effective, as they come from a town in which American ship building had its birth, and which has built more sailing tonnage engaged in the foreign and coastwise trade than any other city in the country.

CHICAGO underwriters are reported as saying that the small number of collision losses on the lakes during the past season may be accounted for largely through the government rule prohibiting the blowing of passing signals in fog. It may appear like a very bold assertion, in the face of the law on the subject, to say that, notwithstanding the law, full ninety per cent. of the men in charge of steam vessels have during the past season been blowing passing signals in all kinds of weather, just as they did in previous years, but such is the fact all the same, and this statement would be publicly borne out by the masters themselves if they dare tell the truth.

ALTHOUGH GEN. POE has said nothing on the subject of enlarging the present St. Mary's Falls canal lock after the new big lock is completed next year, it is understood by people who are in close touch with him on such matters that he favors the deepening of the old lock at the earliest possible date, in order to make it of uniform usefulness with the new one.

Anthracite Coal Shipments and Freight Rates.

As a matter of record, shipments of hard coal from Buffalo to upper lake ports, which have been noted in monthly reports, are here printed in full, together with average freight rates for ten years past:

SHIPMENTS OF ANTHRACITE COAL OUT OF BUFFALO.

	Net tons.
1893	2,703,673
1894	2,485,255
Decrease in 1894	218,418

AVERAGE OF RULING LAKE FREIGHT RATES, HARD COAL, BUFFALO TO PORTS NAMED.

Year.	Chicago.	Duluth.	Toledo.
1885	$0 71	$0 52	.....
1886	87	62	.....
1887	1 05	70	$0 35
1888	86	65	41
1889	52	41	27
1890	62	43	33
1891	56	29	25
1892	59	43	27
1893	49	29	28
1894	46	25	25
Average for all years noted	67	46	30

Rate to Milwaukee usually same as Chicago, and Detroit rate about the same as Toledo rate.

Coal is shipped in net tons and handled without charge to vessel.

LEADING PARTICULARS OF SHIPS OF THE NEW UNITED STATES NAVY—JAN. 1, 1895.

INCLUDES ALL VESSELS UNDER CONSTRUCTION — PREPARED IN OFFICE OF BUREAU OF STEAM ENGINEERING, NAVY DEPARTMENT, WASHINGTON, D. C, FROM OFFICIAL DEPARTMENT RECORDS.

NAME.	CLASS.	BUILDERS OF		Displacement.	Indicated Horse Power.	Speed, in Knots.	Contract Price.	Premiums for Speed or I. H. P.
		HULL.	MACHINERY.					
Iowa	Battleship	Cramp & Sons	Cramp & Sons	11,296	11,000	16	$ 3,010,000	Building.
Indiana	Battleship	Cramp & Sons	Cramp & Sons	10,200	9,000	15	3,020,000	Building.
Massachusetts	Battleship	Cramp & Sons	Cramp & Sons	10,200	9,000	15	3,020,000	Building.
Oregon	Battleship	Union Iron Works	Union Iron Works	10,200	9,000	15	3,180,000	Building.
Brooklyn	Armored cruiser	Cramp & Sons	Cramp & Sons	9,153	16,000	20	2,986,000	Building.
New York	Armored cruiser	Cramp & Sons	Cramp & Sons	8,480	17,025	21	2,985,000	$ 200,000
Columbia	Protected cruiser	Cramp & Sons	Cramp & Sons	7,375	18,077	22.8	2,725,000	350,000
Minneapolis	Protected cruiser	Cramp & Sons	Cramp & Sons	7,350	21,000	23.07	2,690,000	414,600
Maine	Armored cruiser	New York Navy Yard	Quintard Iron Works	6,648	9,224	17		22,429
Texas	Battleship	Norfolk Navy Yard	Richmond Loco. Works	6,300	8,600	17		Not tried.
Puritan	Monitor	John Roach & Son	John Roach & Son	6,060	3,700	12.4	Built under	"repairs."
Olympia	Protected cruiser	Union Iron Works	Union Iron Works	5,570	17,036	21.68	$ 1,796,000	$ 300,000
Chicago	Protected cruiser	Jonn Roach & Son	John Roach & Son	4,543	4,606	15.32	889,000	None.
Baltimore	Protected cruiser	Cramp & Sons	Cramp & Sons	4,500	9,877	20.09	1,325,000	106,442
Philadelphia	Protected cruiser	Cramp & Sons	Cramp & Sons	4,325	8,653	19.7	1,350,000	100,000
Newark	Protected cruiser	Cramp & Sons	Cramp & Sons	3,980	8,674	19	1,248,000	36,857
San Francisco	Protected cruiser	Union Iron Works	Union Iron Works	4,088	9,717	19 518	1,428,000	100,000
Monterey	Coast defense vessel	Union Iron Works	Union Iron Works	4,000	5,072	13.6	1,628,950	* 32,823
Amphitrite	Monitor	Harlan&HollingsworthCo.	Harlan&Hollingsworth Co.	3,990	1,600	11	B'lt under	"repairs."
Miantonomoh	Monitor	John Roach & Son	John Roach & Son	3,990	1,426	10.5		
Terror	Monitor	Cramp & Sons	Cramp & Sons	3,990	1,600	11		
Monandnock	Monitor	Mare Island Navy Yard	Mare Island Navy Yard	3,990	3,000	13.5		
Charleston	Protected cruiser	Union Iron Works	Union Iron Works	3,557	6,452	18.2	$ 1,017,500	* 33,384
Atlanta	Protected cruiser	John Roach & Son	John Roach & Son	3,305	3,570	15.4	617,000	None.
Boston	Protected cruiser	John Roach & Son	John Roach & Son	3,235	3,936	15.58	619,000	None.
Cincinnati	Protected cruiser	New York Navy Yard	New York Navy Yard	3,183	10,000	20	Built by government.	
Raleigh	Protectod cruiser	Norfolk Navy Yard	New York Navy Yard	3,183	10,000	20		
Katahdin	Ram	Bath Iron Works	Bath Iron Works	2,183	4,800	17	$ 930,000	Building.
Detroit	Protected cruiser	Columbian Iron Works	Columbian Iron Works	2,068	5,202	18.71	612,500	$ 150,000
Marblehead	Protected cruiser	City Point Works	Quintard Iron Works	2,050	4,915	18.44	674,000	125,000
Montgomery	Protected cruiser	Columbian Iron Works	Columbian Iron Works	2,079	5,527	19.05	612,500	200,000
Bennington	Gunboat	John Roach & Son	Quintard Iron Works	1,700	3,359	17.5	490,000	3,609
Concord	Gunboat	John Roach & Son	Quintard Iron Works	1,740	3,341	16.8	490,000	453
Yorktown	Gunboat	Cramp & Sons	Cramp & Sons	1,703	3,324	16.14	455,000	39,825
Dolphin	Dispatch vessel	John Roach & Son	John Roach & Son	1,485	2,185	15.5	315,000	None.
Gunboat 7	Gunboat	Newport News Ship Building & Dry Dock Co		1,371	1,750	14	280,000	Building.
Gunboat 8	Gunboat			1,315	1,600	13	280,000	
Gunboat 9	Gunboat			1,315	1,600	13	280,000	
Castine	Gunboat	Bath Iron Works	Bath Iron Works	1,068	3,162	16.03	318,000	$ 50,000
Machias	Gunboat	Bath Iron Works	Bath Iron Works	1,068	1,828	15.46	318,000	45,000
Vesuvius	Torpedo vessel	Cramp & Sons	Cramp & Sons	930	3,732	22.5	350.000	None.
Petrel	Gunboat	Columbian Iron Works	Columbian Iron Works	890	1,055	11.8	247,000	* 485
Bancroft	Practice vessel	Moore & Sons	Moore & Sons	832	1,190	14.37	250,000	45,000
Ericsson	Torpedo boat	Iowa Iron Works	Iowa Iron Works	120	1,800	24	113,500	Aw'ti'g trial
Cushing	Torpedo boat	Herreshoff M'f'g Co	Herreshoff Mfg. Co	125	1,297	17.5	82,750	None.

* Penalties deducted.

NOTE—Addresses of firms mentioned in above list are: Cramp & Sons, Philadelphia, Pa.; Union Iron Works, San Francisco, Cal.; John Roach & Son, now Delaware River Iron Ship Building and Engine Works, Chester, Pa; Harlan & Hollingsworth Co., Wilmington, Del.; Bath Iron Works, Bath, Me.; Columbian Iron Works, Baltimore, Md.; City Point Works, Boston, Mass.; Newport News Ship Building and Dry Dock Company, Newport News, Va.; Samuel L. Moore & Sons, Elizabethport, N. J.; Iowa Iron Works, Dubuque, Ia.; Herreshoff Mfg. Co., Bristol, R. I.; Quintard Iron Works, New York, N. Y.; Richmond Locomotive Works, Richmond, Va.

Leading Particulars of Naval Ships.

The large table on this page giving leading particulars of ships of the new United States navy was prepared for the REVIEW in the office of Commodore Melville, chief of the bureau of steam engineering, navy department. For reference, this compact collection of information will prove very handy to anyone in any way interested in naval vessels. The only vessels authorized by congress and not included in the table are three torpedo boats, for which contracts have not as yet been placed.

Trade Notes.

Since attention has been given to the subject of forced draft for lake steamers, another concern, the Buffalo Forge Company of Buffalo, N. Y., has entered the field with a forced draft apparatus. The company sends us a copy of a letter from Mr. W. T. Sauber, engineer of the steamer Gratwick, which is fitted with the apparatus. Mr. Sauber says: "We have not been able to get slack coal and have burned mostly lump. I find in this a saving of more than 10 per cent. in the better consumption under forced draft. On one trip we took on a car load of slack to try it, and I worked the engine for two and a half hours at full stroke with more steam than was wanted. I think we can with the draft burn anything that looks like coal and have all the steam that is desired." Mr. E. S. Ludlow, No. 367 Sibley street, Cleveland, represents the Buffalo company in Ohio and expresses a willingness to call upon owners or engineers and give any desired information regarding forced draft.

The Babcock & Wilcox Company's marine type of water tube boiler will appear in two boats of fair size on the lakes next season. Mr. Hoxie of New York and Mr. Charles Wilson, who represents the company at St. Paul, have for some time past been figuring with lake builders and owners and they succeeded, a few days ago, in selling the Port Huron and Detroit Rapid Transit Company two boilers to develop 1,500 horse power for the new river steamer Unique, which is intended for very fast service between Detroit and Port Huron. They have also sold to Mr. Isaac Bearinger of Saginaw, Mich., a boiler to develop 450 horse power for his steam yacht Wapita, which is now being lengthened by F. W. Wheeler & Co, of West Bay City.

Thomas Drein & Son of Wilmington, Del., manufacturers of patent metallic life boats, rafts and life preservers, send us a list of twenty-five or more crafts, from harbor tugs to the big American Line steamers St. Louis and St. Paul, which they are equipping with their specialties, and ask that lake ship builders be reminded of the advantage of placing orders now for equipment of this kind, that delays during the spring rush, especially for the metallic life boats, may be avoided. Payment on such orders, they say, need not be made until time of delivery. This firm's specialties are used by builders in all parts of the country and need no introduction on the lakes.

The Free Ship Bill.

BY RICHARD P. JOY.

Tear down our starry banner,
Old glory soon must fade,
From peaks of home-built vessels,
That long have cleft the wave.

No more shall shipwrights' hammers ring,
No more shall anvils sound,
Our congress is to pass a bill
To tear our banner down.

We've seen that starry banner
Flaunt in the face of death,
We've seen it humble Britain's pride,
'Mid taunts from dying breath.

We've seen the flag victorious,
We've seen like streaks of flame,
That banner waving o'er us
With ne'er a blush of shame.

We've seen men die beneath its folds,
Before they'd haul it down,
But congress now will lower it,
And trail it on the ground.

We've seen almighty Cleveland,
Let go the halyards with a run,
It's ne'ver been done before that day
In lands beneath the sun.

What would our gallant heroes think,
If they could look and see,
Great Cleveland standing at the wheel,
A' steering out to sea?

He's far beyond the sight of land
And hopelessly adrift,
He's waiting patiently to see,
If the wind will never shift.

A free ship bill 's before the house,
And congress is at sea,
Lord help the gallant Ship of State,
Safely to make a lee.

How will it help our shipping
To let ships come in free,
Americans can't run 'em then,
Unless some aid have they.

Foreigners bounty their marines.
And subsidize mail ships,
Our vessels do not stand a show,
Against such ships as this.

Is not our labor just as good
As that of foreign lands,
We taught the world to clippers build,
Why should we tie our hands.

Why pass a foolish, vicious bill,
That won't help things at all,
Stand by your country's colors till
The heavenly trumpets call.

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

530,331. **Steam Boiler.** Peter Ferguson and William Y. Fleming, Paisley, Scotland. Filed Aug. 24, 1894. Serial No. 521,207.

Claim—In a steam boiler, the combination of two or more water drums *b* in proximity to the furnace, an independent steam and water drum *a* in the uptake, said drums *a* and *b* being independent of each other, a number of small water tubes *d* connecting the drums *b* and *a* and each adapted to be withdrawn into the main drum *a*, and independent circulating tubes *f* fitted outside of the furnace and smoke casing and connecting the lower drums with the upper drum and having a capacity sufficient to give a supply of water equal to that flowing through the small tubes *d*.

530,525. **Life Saving Apparatus.** Klaas Hoekstra, Battle Creek, Mich. Filed Feb. 13, 1894. Serial No. 499,999.

Claim.—In a life saving apparatus, a truck, a pivoted and rotating line drum, a pivoted gun barrel connected to the line drum, and a detachable winding connection between the drum and frame.

530,675. **Dredging Machine.** John A. Ball, Grass Valley, Cal. Filed Feb. 11, 1892. Serial No. 421,156.

Claim.—In a dredging apparatus, the combination of a hull, a bridge frame having anchoring spuds and pivotally connected to the hull, a wheel or gypsy on the bridge frame, and a chain or rope passing around said wheel or gypsy and having each of its ends connected rigidly to the hull, and means for turning said wheel in either direction and thereby causing the hull to swing laterally independently of the anchored bridge frame. An endless chain and bucket dredging mechanism mounted upon a sweeping or oscillating support, and an inclined face ladder combined with rigid channel tracks, rollers or wheels within the chains arranged to run in the channel tracks whereby said buckets are held to the work rigidly, and directed in a right line against vertical and lateral yielding.

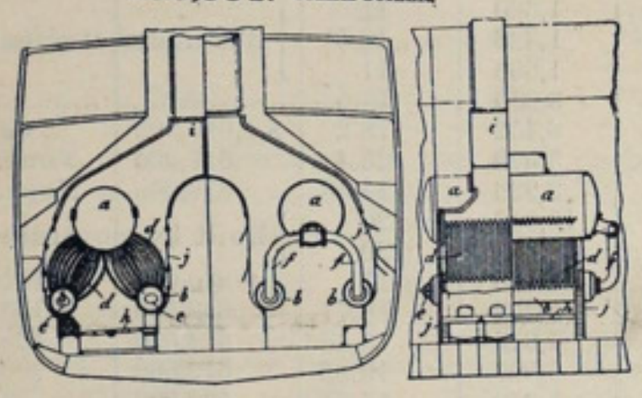
530,850. **Apparatus for Removing Ashes from Fire-holds of Vessels.** Alexander McDougall, Duluth, Minn. Filed Jan. 9, 1893. Serial No. 457,795.

Claim.—In an apparatus for removing ashes from the fireholds of vessels, the combination of a metallic tank or ash box open at its upper end; the metallic grating C within said metal tank or ash box and near its upper end; the pipe D connecting with the outside water and entering said metal tank or ash box at a point above said grating C; the sea valve E in said pipe D; the centrifugal pump F adjacent to said metal tank or ash box; the suction pipe of said pump entering said metal tank or ash box at the lower end thereof; the discharge pipe G of said pump passing outside of the vessel at a point near the water line; the engine I for operating said pump and the casing J for covering said engine.

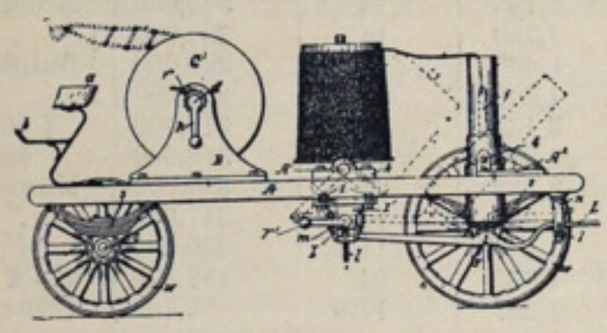
530,851. **Apparatus for Removing Ashes from Fire-holds of Vessels.** Alexander McDougall, Duluth, Minn. Filed Jan. 12, 1894. Serial No. 496,673.

Claim. In an apparatus for removing ashes, the combination of the ash box B, formed within, and a part of, the water bottom of a vessel; the precipitating pipe K, entering the same; the discharge pipe H, and the pump E, within said ash box and connecting with said discharge pipe.

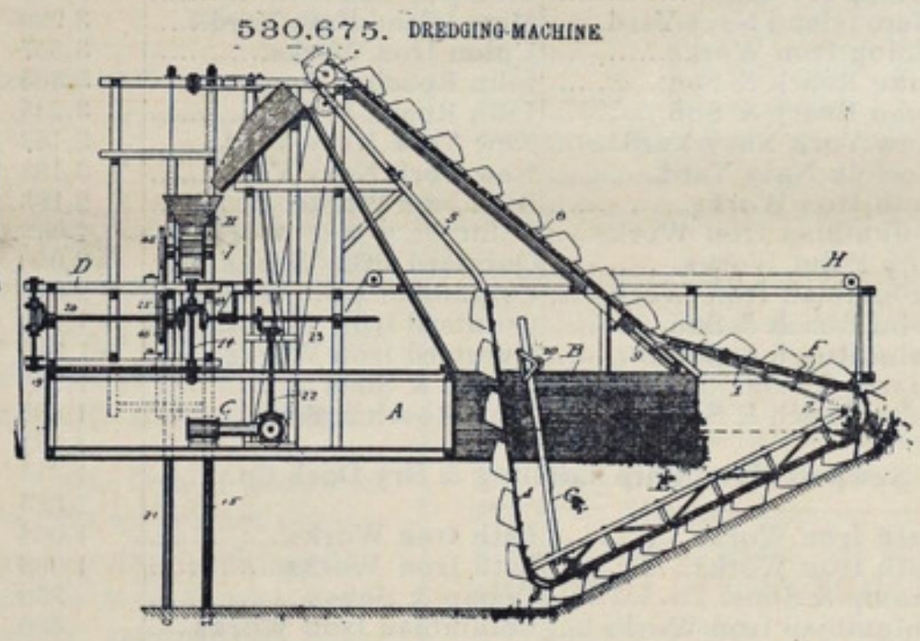
530,331. STEAM-BOILER.



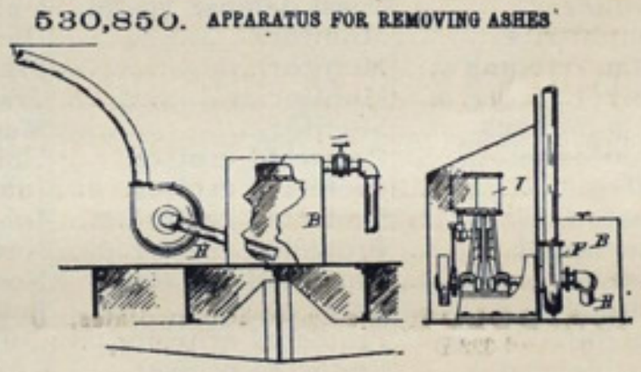
530,525. LIFE-SAVING APPARATUS.



530,675. DREDGING-MACHINE.



530,850. APPARATUS FOR REMOVING ASHES.



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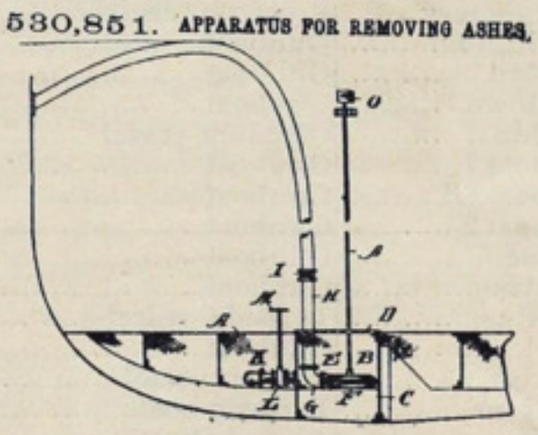

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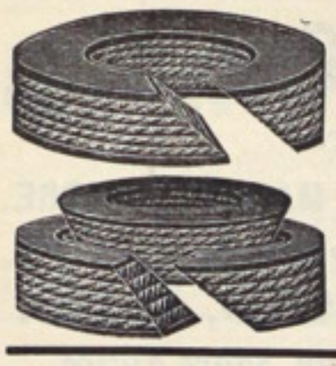

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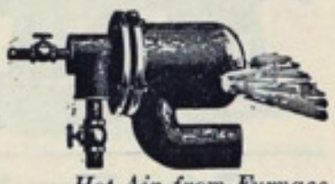

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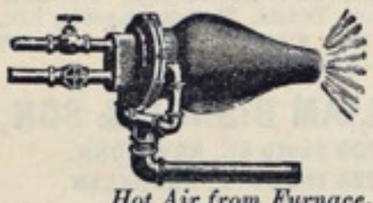

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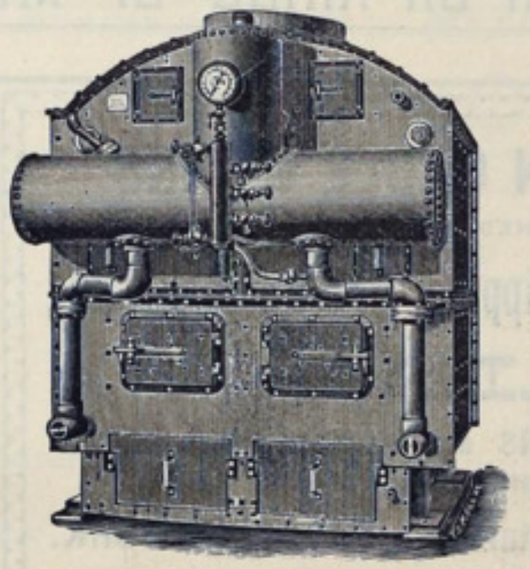

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The small charge of $1 will be made for tieing up at the dock, for each 24 hours or fraction thereof, for all classes of freight carriers.

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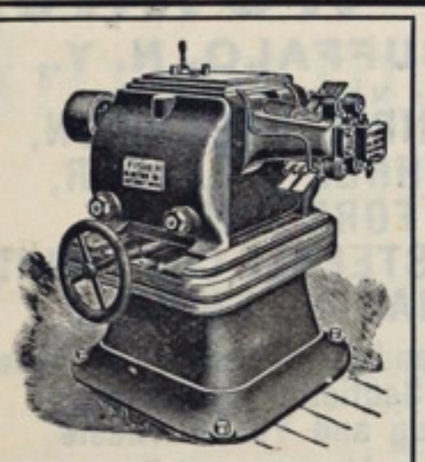

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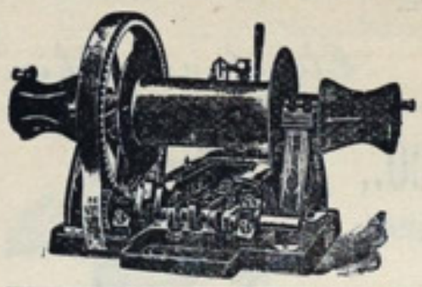

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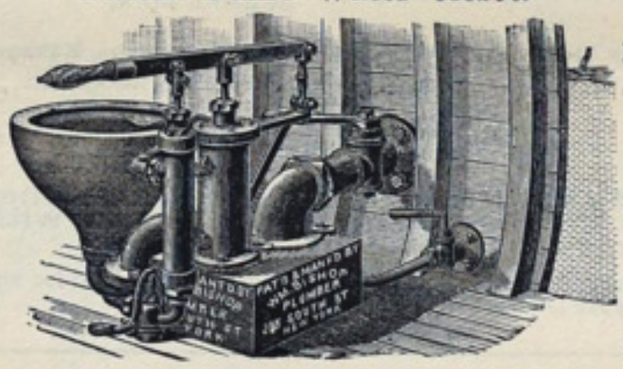

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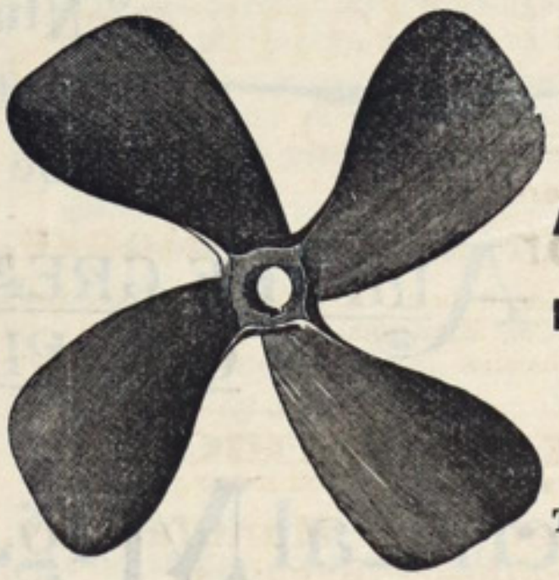

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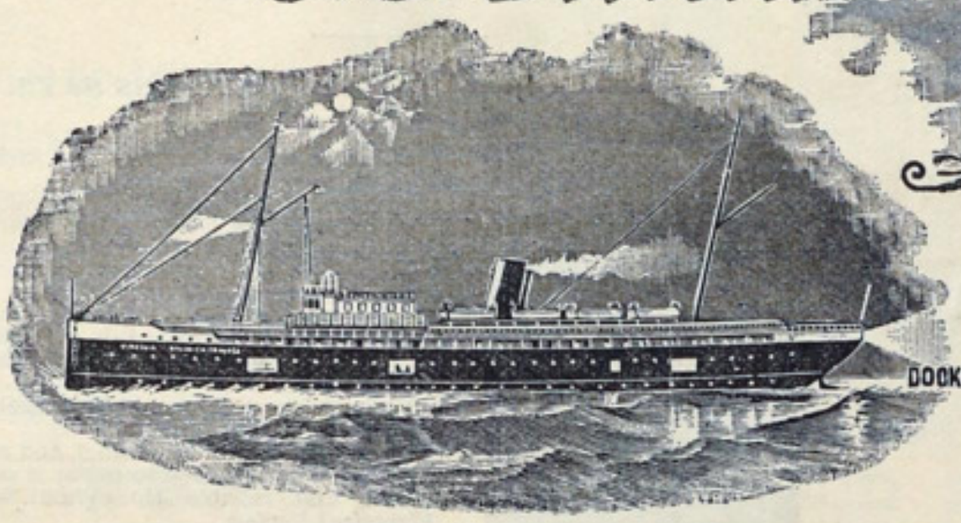

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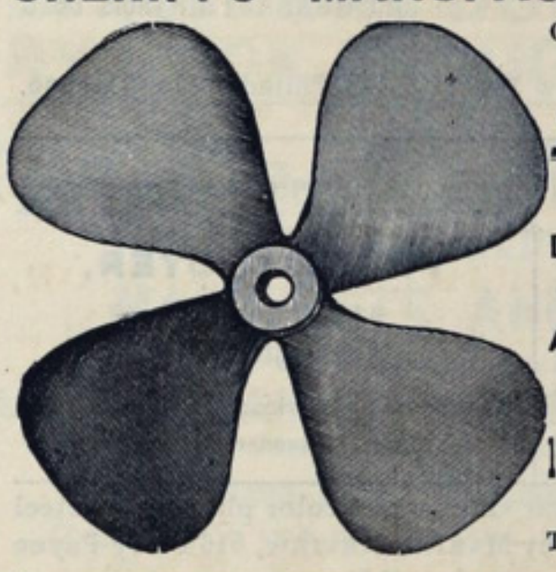

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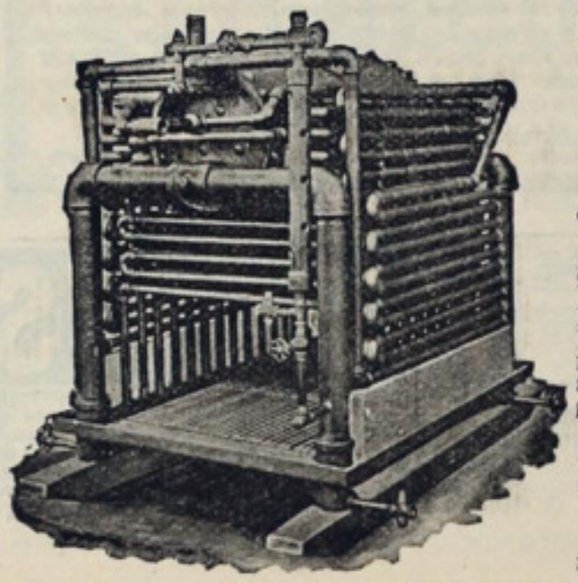

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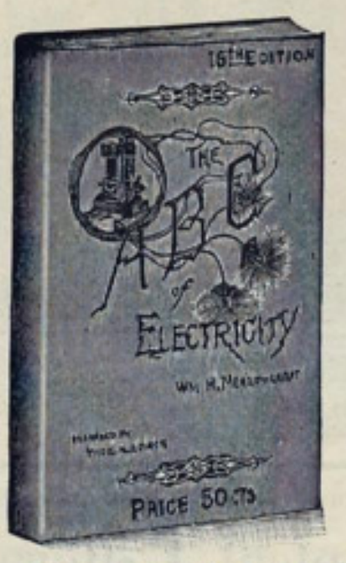

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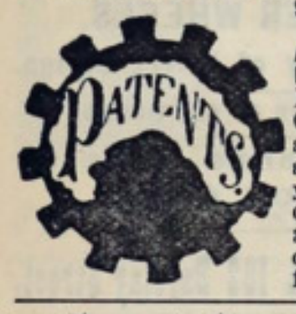

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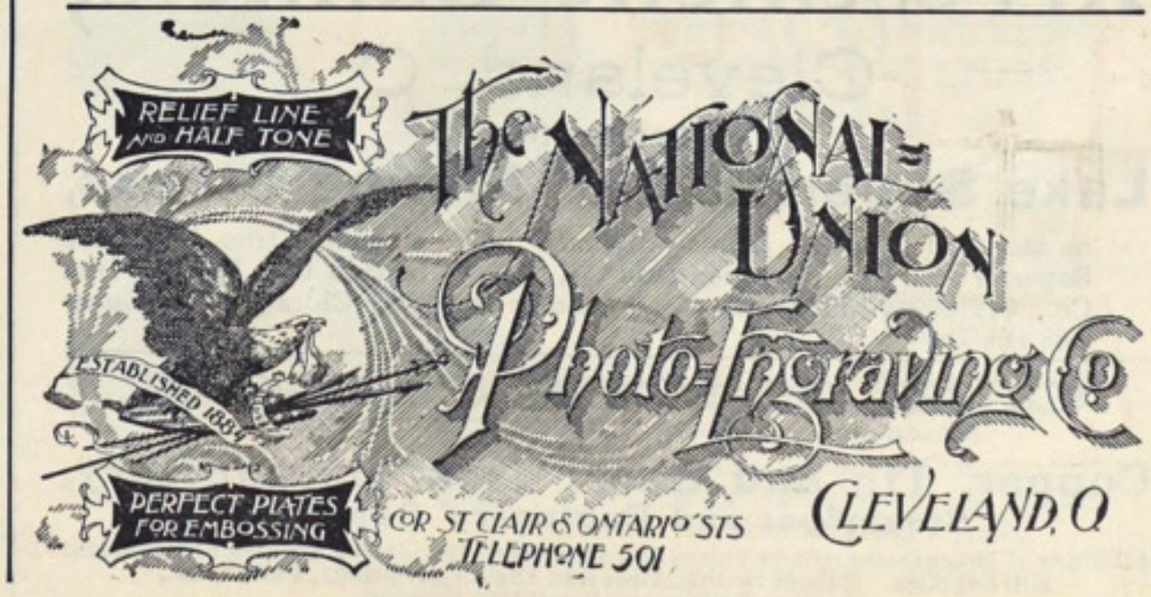

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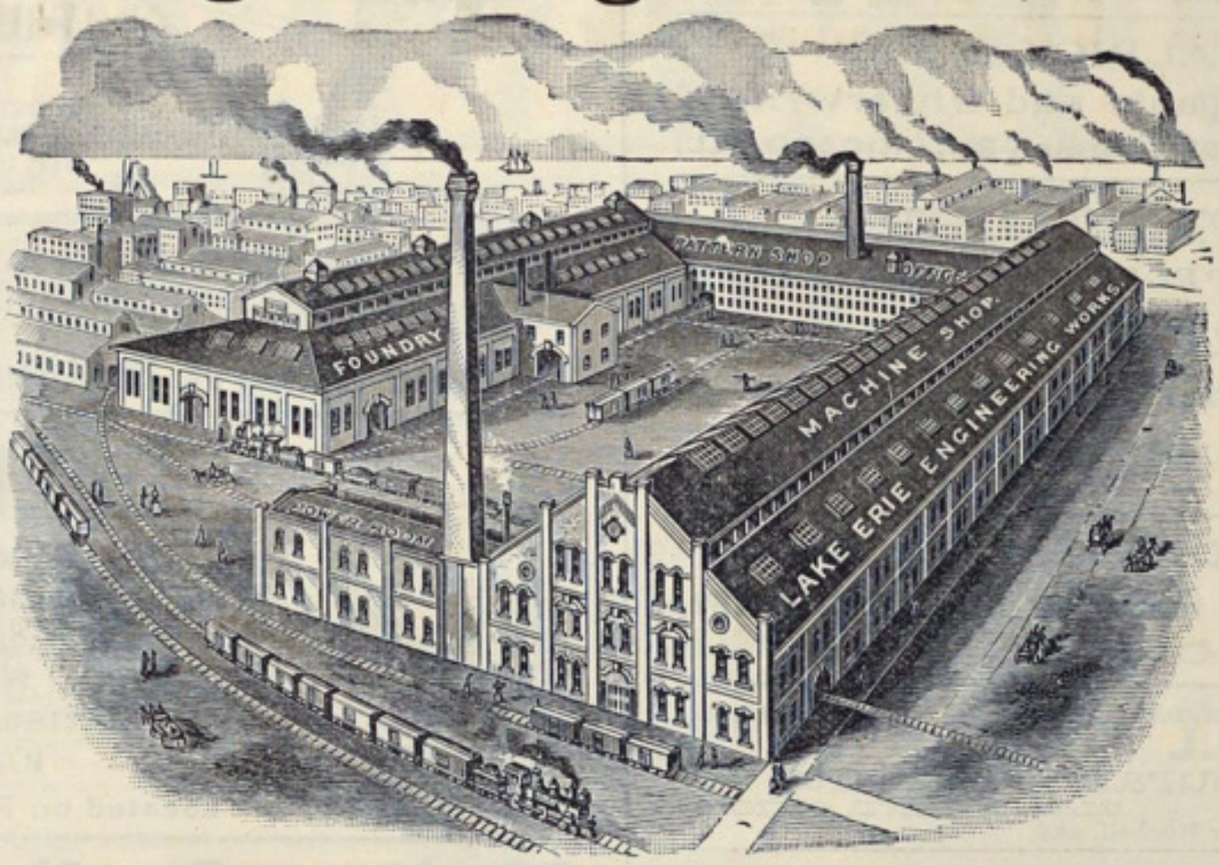

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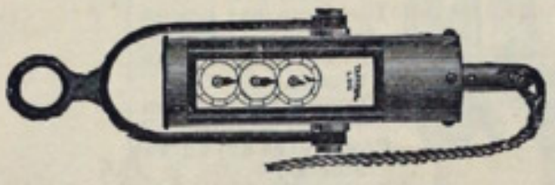

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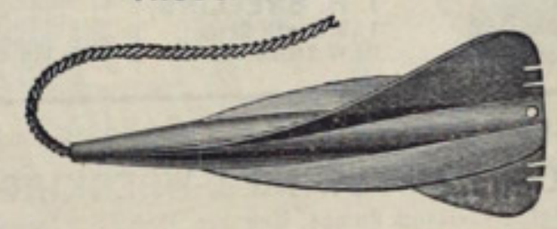

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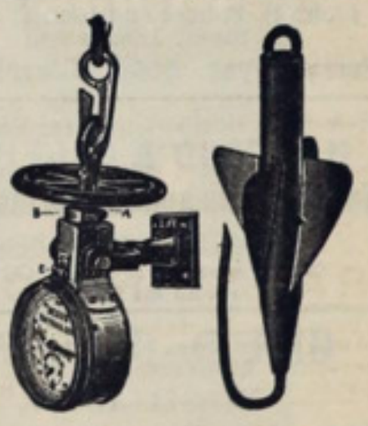

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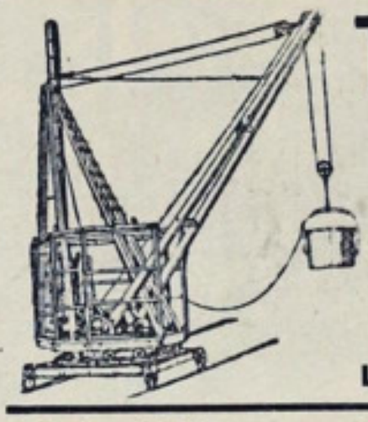
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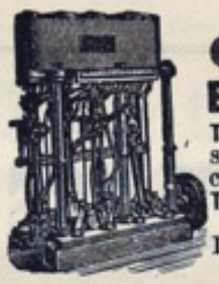
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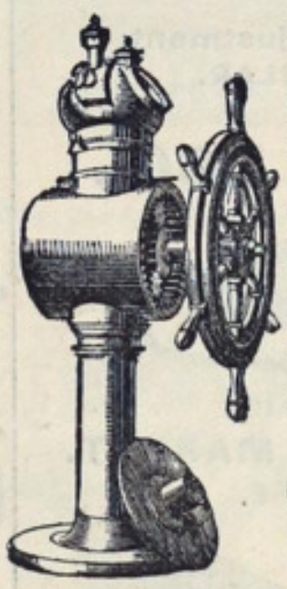
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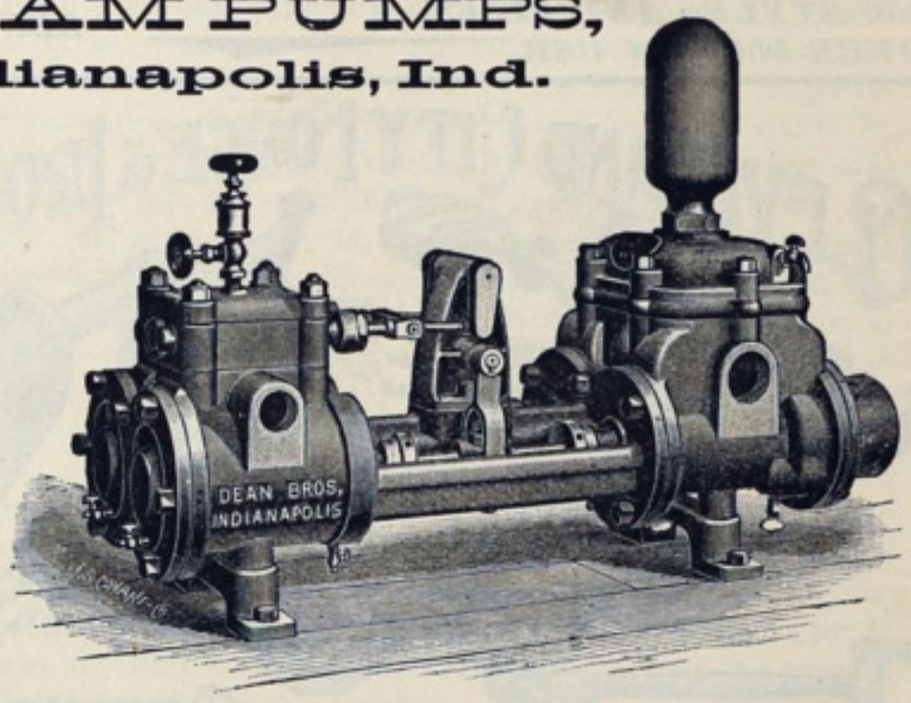

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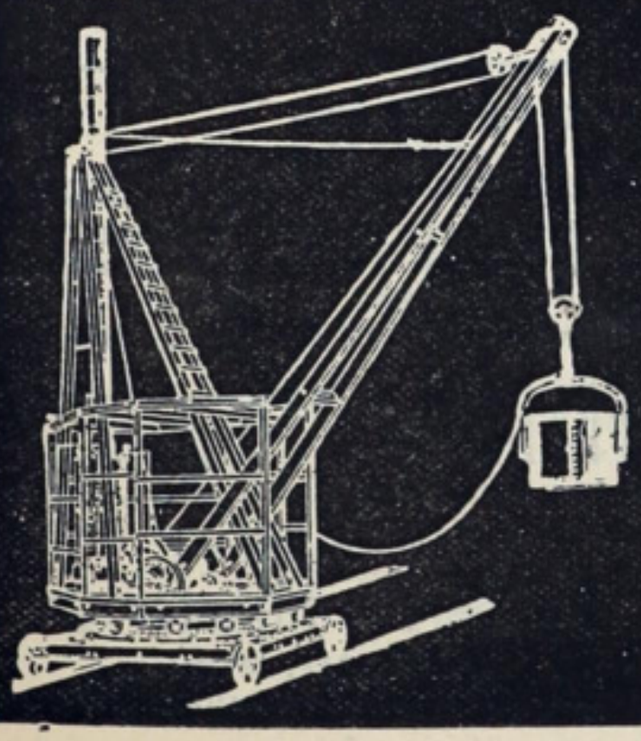

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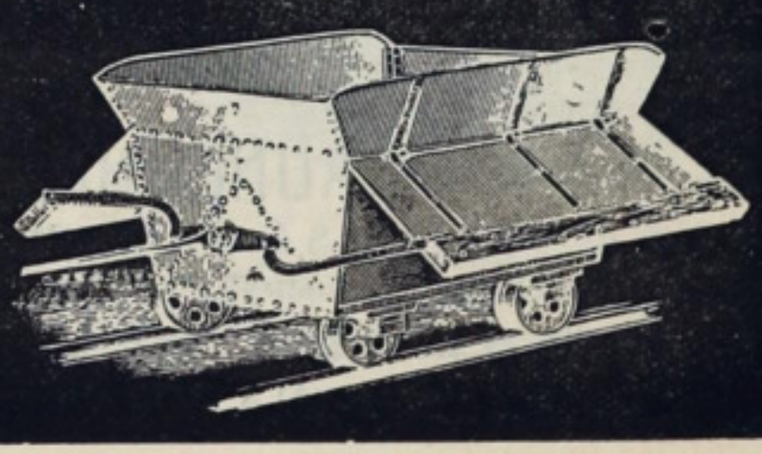

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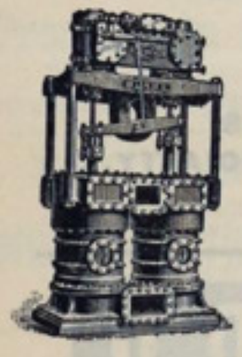

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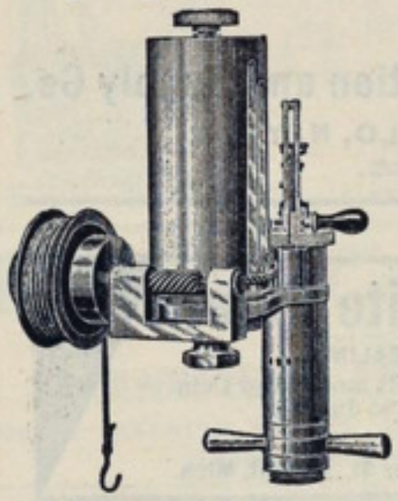

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